

Countries in stage 4 of the demographic transition can be identified on the map of total fertility rate (Figure 2-9). Most European countries have reached stage 4 of the demographic transition because they have TFRs well below the ZPG replacement level of 2.1. In the United States, the TFR has moved slightly below ZPG since 2000.

Social customs again explain the movement from one stage of the demographic transition to the next. Increasingly, women in stage 4 societies enter the labor force rather than remain at home as full-time homemakers. When most families lived on farms, employment and child rearing were conducted at the same place, but in urban societies most parents must leave the home to work in an office, shop, or factory. An employed parent must arrange for someone to take care of their preschool-age children during working hours.

Changes in lifestyle also encourage smaller families. People who have access to a wider variety of birth-control methods are more likely to use some of them. With increased income and leisure time, more people participate in entertainment and recreation activities that may not be suitable for young children, such as attending cultural events, traveling overseas, going to bars, and eating at upscale restaurants.

Several Eastern European countries, most notably Russia, have negative NIRs, meaning that the number of deaths exceeds the number of births (refer to Figure 2-7). Eastern Europe's relatively high death rates and low birth rates are a legacy of a half century of Communist rule. Higher death rates have resulted from inadequate pollution controls (see Chapter 9 Contemporary Geographic Tools box), and lower birth rates have resulted from very strong family-planning programs and deep-seated pessimism about having children in an uncertain world. As memories of the Communist era fade, Russians and other Eastern Europeans may display birth and death rates more comparable to those in Western Europe. Alternatively, demographers in the future may identify a fifth stage of the demographic transition, characterized by higher death rates than birth rates and an irreversible population decline.

A country that has passed through all four stages of the demographic transition has in some ways completed a cycle—from little or no natural increase in stage 1, to little or no natural increase in stage 4. Two crucial demographic differences underlie this process, however. First, at the beginning of the demographic transition, the CBRs and CDRs are high—35 to 40 per 1,000—whereas at the end of the process the rates are very low, approximately 10 per 1,000. Second, the total population of the country is much higher in stage 4 than in stage 1.

The Demographic Transition in England

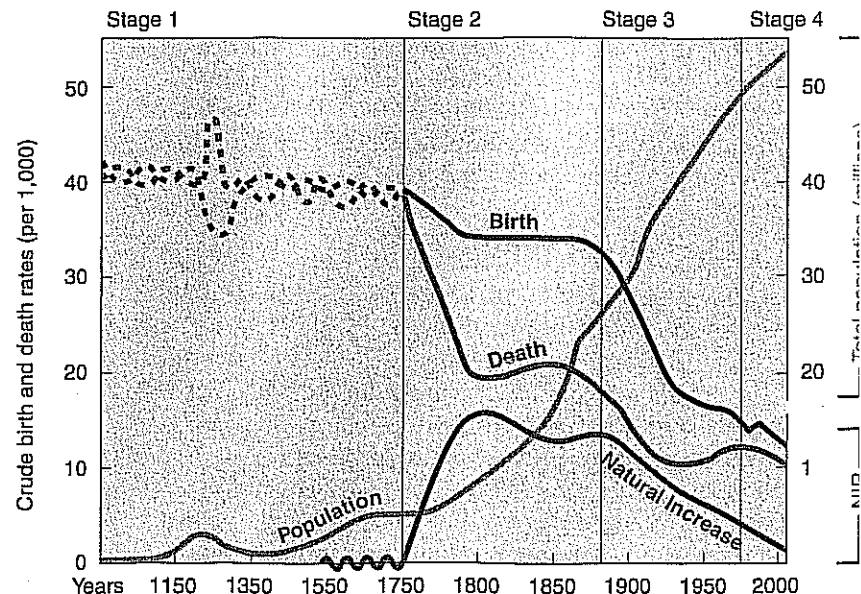
England provides a good case study of the long-term impact of the demographic transition, for several reasons. England has reached stage 4, and at least fragmentary information on its population is available for the past 1,000 years. Further, unlike the United States and many other countries, England has not changed its boundaries, nor has it been affected by migration of enough people to affect national trends.

STAGE 1: LOW GROWTH UNTIL 1750. In 1066, when the Normans invaded England, the country's population was approximately 1 million. Seven hundred years later the population was only 6 million, and the country was still in stage 1 of the demographic transition (Figure 2-14).

During that 700-year period, the population rose in some years and fell in others. For example, England's population declined from 4 million in the year 1250 to 2 million a century later after the Black Death (bubonic plague) and famines swept the country. CBRs and CDRs averaged more than 35 per 1,000 but varied considerably from one year to the next. As recently as the 1740s, the CDR skyrocketed following a series of bad harvests.

STAGE 2: HIGH GROWTH (1750–1880). In 1750 the CBR and CDR in England were both 40 per 1,000. In 1800 the CBR remained very high at 34, but the CDR had plummeted to 21

FIGURE 2-14 Demographic transition for England. Demographers must estimate birth and death rates prior to 1750, because precise records are not available. Church parish records of births, baptisms, marriages, and burials help in making estimates. England entered stage 2 of the demographic transition in the mid-eighteenth century, stage 3 in the late nineteenth century, and stage 4 in the mid-twentieth century.



This 50-year period marked the start of the Industrial Revolution in England. New production techniques increased the nation's food supply and generated money that was spent on improvements in public health.

England remained in stage 2 of the demographic transition for about 125 years. During that period the population rose from 6 million to 30 million, an average annual NIR of 1.4 percent.

STAGE 3: MODERATE GROWTH (1880–EARLY 1970s).

Crude birth and death rates changed little in England during most of the nineteenth century. In 1880 the CBR was 33 per 1,000 and the CDR 19, in both cases only 1 per 1,000 lower than in 1800. After 1880 England entered stage 3 of the demographic transition. The CDR continued to fall somewhat over the next century, from 19 per 1,000 in 1880 to 12 in 1970. However, the CBR declined sharply, from 33 per 1,000 in 1880 to 18 by 1930 and 15 in 1970. The population increased between 1880 and 1970 from 26 million to 49 million, about 0.7 percent per year.

STAGE 4: LOW GROWTH (EARLY 1970s–PRESENT).

England has been in stage 4 of the demographic transition since the early 1970s. The CBR has varied between 12 and 14 per 1,000; the CDR has varied between 10 and 12. The CBR increases slightly in some years because the number of women in their childbearing years is greater, not because of decisions by women to have more children. TFR has long been well below the 2.1 needed for replacement. England's population has grown by 3 million since 1970, primarily because of immigration from former colonies.

When England began to progress through the demographic transition around 1750, the country had 6 million people, crude birth and death rates of 40 per 1,000, and a record of little population growth over the previous 700 years. For the past three decades, England has been in another period of little population growth. The difference is that the crude birth and death rates are now around 11 rather than 40, and the country has 50 million inhabitants instead of 6 million.

Population Pyramids

A country's stage of demographic transition gives it a distinctive population structure. Population in a country is influenced by the demographic transition in two principal ways—the percentage of the population in each age group and the distribution of males and females.

A country's population can be displayed by age and gender groups on a bar graph called a population pyramid. A population pyramid normally shows the percentage of the total population in 5-year age groups, with the youngest group (0 to 4 years old) at the base of the pyramid and the oldest group at the top. The length of the bar represents the percentage of the total population contained in that group. By convention, males are usually shown on the left side of the pyramid and females on the right.

The shape of a pyramid is determined primarily by the CBR in the community. A country in stage 2 of the demographic transition, with a high CBR, has a relatively large number of

young children, making the base of the population pyramid very broad. On the other hand, a country in stage 4, with a relatively large number of older people, has a graph with a wider top that looks more like a rectangle than a pyramid.

Age Distribution

The age structure of a population is extremely important in understanding similarities and differences among countries. The most important factor is the dependency ratio, which is the number of people who are too young or too old to work, compared to the number of people in their productive years. The larger the percentage of dependents, the greater the financial burden on those who are working to support those who cannot.

To compare the dependency ratios of different countries, we can divide the population into three age groups—0 to 14, 15 to 64, and 65 and older. People who are 0–14 years of age and 65-plus are normally classified as dependents. Nearly one-half of all people living in countries in stage 2 of the demographic transition are dependents, compared to only one-third in stage 4 countries. Consequently, the dependency ratio is nearly 1:1 in stage 2 countries, whereas in stage 4 countries the ratio is 1:2 (one dependent for every two workers). Young dependents outnumber elderly ones by 10:1 in stage 2 countries, but the numbers of young and elderly dependents are roughly equal in stage 4 countries.

One-third of the people are under age 15 in the LDCs and still in stage 2 of the demographic transition. In contrast, in European and North American countries, which are at or near stage 4 of the demographic transition, one-sixth of the population is under age 15 (Figure 2–15).

The large percentage of children in sub-Saharan Africa and other stage 2 countries strains the ability of poorer countries to provide needed services such as schools, hospitals, and day-care centers. When children reach the age of leaving school, jobs must be found for them, but the government must continue to allocate scarce resources to meet the needs of the still growing number of young people.

As countries pass through the stages of the demographic transition, the percentage of elderly people increases. The higher percentage partly reflects the lower percentage of young people produced by declining CBRs. Older people also benefit in stage 4 countries from improved medical care and higher incomes. People over age 65 comprise 16 percent of the population in Europe compared to 3 percent in sub-Saharan Africa. In some cities in Florida more than one-third of the residents are over age 65.

Older people must receive adequate levels of income and medical care after they retire from their jobs. The "graying" of the population places a burden on European and North American governments to meet these needs. More than one-fourth of all government expenditures in the United States, Canada, Japan, and many European countries go to Social Security, health care, and other programs for the older population. Because of the larger percentage of older people, countries in stages 3 and 4 of the demographic transition, such as the United States and Sweden, have higher CDRs than do stage 2 countries.

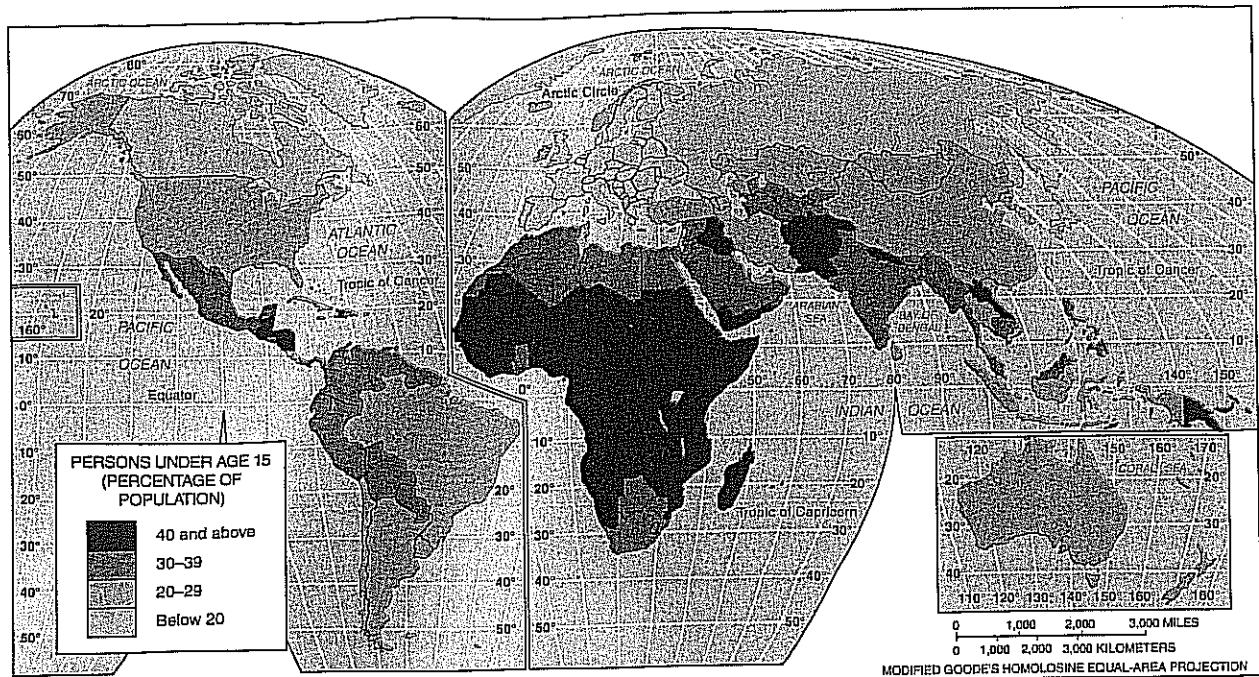


FIGURE 2-15 Percent of the population under age 15. Approximately one-third of the world's inhabitants are under age 15, but the percentage varies from over 40 percent in most African countries to less than 20 percent in many European countries. A map of the percentage of people over age 65 would show a reverse pattern, with the highest percentages in Europe and the lowest in sub-Saharan Africa and the Middle East.

Sex Ratio

The number of males per hundred females in the population is the **sex ratio**. It varies among countries, depending on birth and death rates. In general, slightly more males than females are born, but males have higher death rates. In Europe and North America the ratio of men to women is about 95:100 (that is, 95 men for each 100 women). In the rest of the world the ratio is 102:100.

In the United States, males under age 15 exceed females 105:100. Women start outnumbering men at about age 40, and they comprise 58 percent of the population over age 65. In

poorer countries the high mortality rate during childbirth partly explains the lower percentage of women. The difference also relates to the age structure, because poorer countries have a larger percentage of young people—where males generally outnumber females—and a lower percentage of older people, where females are much more numerous.

The shape of a community's population pyramid tells a lot about its distinctive character, especially compared with other places. In Figure 2-16, compare the shapes of the overall U.S. population pyramid with those for Cedar Rapids, Detroit, Honolulu, and Laredo. Cedar Rapids and Honolulu have relatively flat pyramids; Detroit and Laredo have relatively broad-based ones.

The different shapes result from differences in the ethnic composition of the four cities. Detroit and Laredo have relatively broad-based pyramids, because birth rates are relatively high among African Americans and Hispanic Americans, who form the majority in these two cities. On the other hand, birth rates are relatively low among the Asian American and European-descended communities, the majorities in Honolulu and Cedar Rapids, respectively.

The population pyramid for Naples, where 42 percent of the people are over age 65, resembles an upside-down pyramid. Unalaska, a small town with a military base, has an exceptionally high percentage of males, whereas Naples, with a large percentage of elderly people, has substantially more females than males because females have longer life expectancies. Cities with large universities, such as Lawrence, have an exceptionally high percentage of people in their twenties. See the Contemporary Geographic Tools box for information on collecting statistics about a country's population.



Russia and other European countries have high percentages of elderly people who need pensions, health care, and other services.

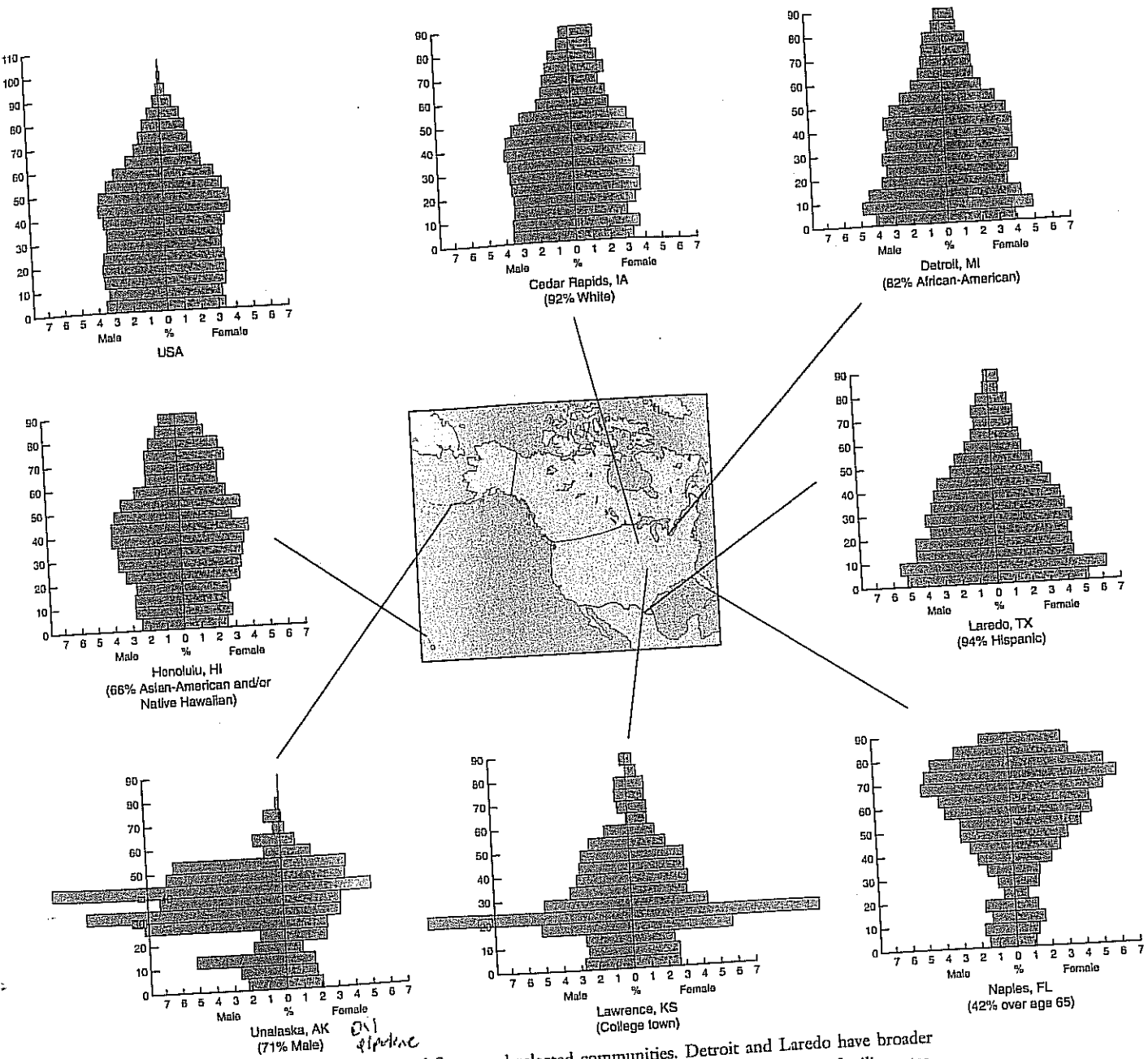


FIGURE 2-16 Population pyramids for the United States and selected communities. Detroit and Laredo have broader pyramids than Cedar Rapids and Honolulu, indicating higher percentages of young people and higher fertility rates. Unalaska has a high percentage of males because it contains an isolated military base. Lawrence has a high percentage of people in their twenties because it is the home of the University of Kansas. Naples has a high percentage of elderly people, especially women, so its pyramid is upside down.

Countries in Different Stages of Demographic Transition

Countries display distinctive population characteristics depending on their stage in the demographic transition. No country today remains in stage 1 of the demographic transition, but it is instructive to compare countries in each of the other three stages. Let us look at three case studies of countries in stages 2,

Cape Verde: Stage 2 (High Growth)

Cape Verde, a collection of 12 small islands in the Atlantic Ocean off the coast of West Africa, moved from stage 1 to stage 2 about 1950. Cape Verde was a colony of Portugal until became independent in 1975, and the Portuguese administrators left better records of births and deaths than are typical for colony in stage 1.

During the first half of the twentieth century, Cape Verde population declined, from 147,000 in 1900 to 137,000 in 194